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(54) Title: SYNTHESIS OF GERMANIUM SULPHIDE AND RELATED COMPOUNDS

(57) **Abstract:** The invention relates to synthesis of germanium sulphide glasses and optical devices formed therefrom. In a chemical vapour deposition process, germanium tetrachloride is reacted with hydrogen sulphide at temperatures in the range 450-700°C to form germanium sulphide. Lower temperatures within this range of 450-550°C directly produce a glass, whereas higher temperatures within the range of 600-700°C produce a crystalline powder which can then be reduced to a glass by subsequent melting and annealing. The reaction is preferably carried out at atmospheric pressure or slightly higher. Thin films and bulk glasses suitable for optical waveguides can be formed directly in one processing step as can powders and microspheres. The materials synthesised are of a high purity with low oxide impurities and only trace levels of transition metal ions.